Title: Backtesting of Time Series Models
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Abstract: In the present work we study the basic models of financial time series (ARMA, GARCH), we focus on parameter estimation and forecasting in estimated models. We describe the means of estimating parametres and future values in the program R. In the theoretical section we also discuss the features of financial time series, define simple returns and log returns and we introduce the benefits of the log returns. We also apply the white noise model, ARMA(1,1) and GARCH(1,1) on historic time series of logarithmic returns of chosen stock exchange indices, we also backtest 1-step ahead forecats and 5-step ahead forecasts and we compare the results of these models. By empirical comparison of real data we also analyze how the models reacted on the present financial crisis and evaluate how the normal distribution assumption for the data held up.

Keywords: time series, ARMA, GARCH, backtesting.